Princeton/BaBar/TNDC-96-51
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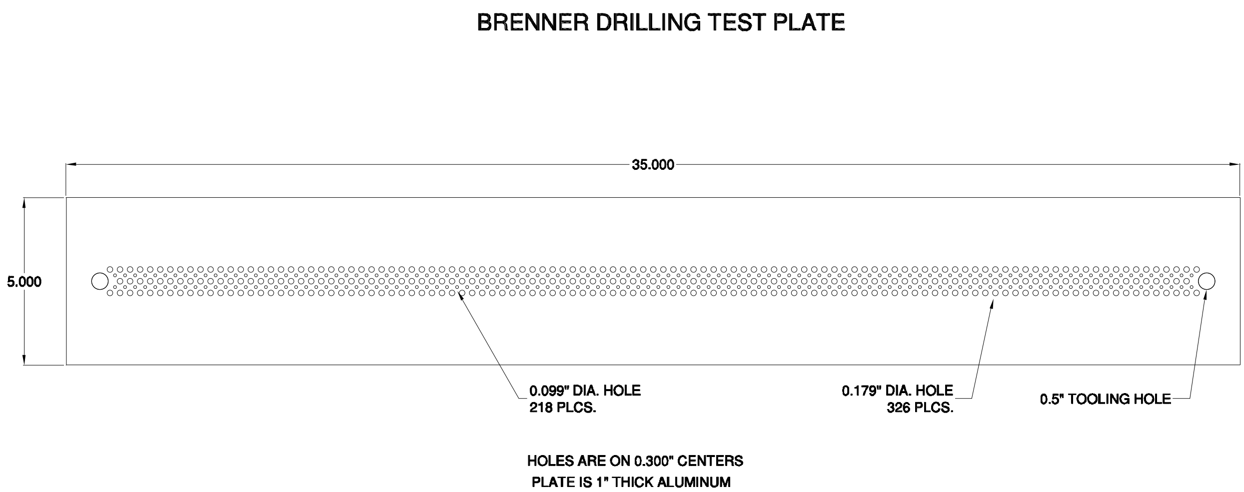
Nov. 22, 1996

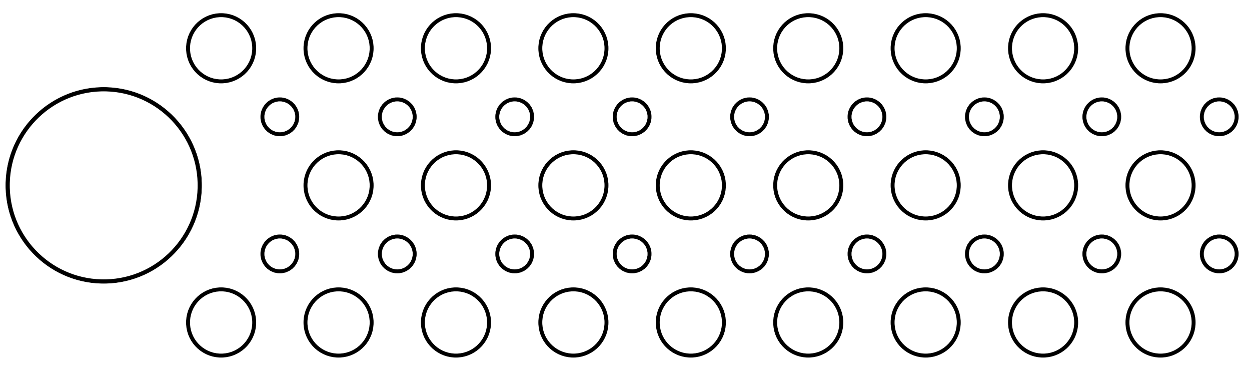
Results from the Brenner Test Plate

We recently received the test plate that was drilled at Brenner Tool and Die, along with five ASCII files summarizing their CMM measurments of the plate.

The results are all well within our specs!

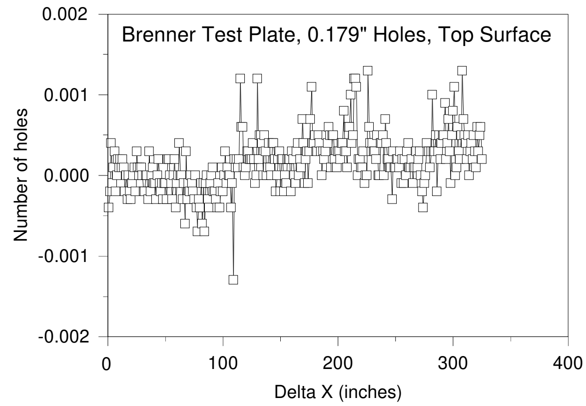
The hole pattern on the plate is shown below.

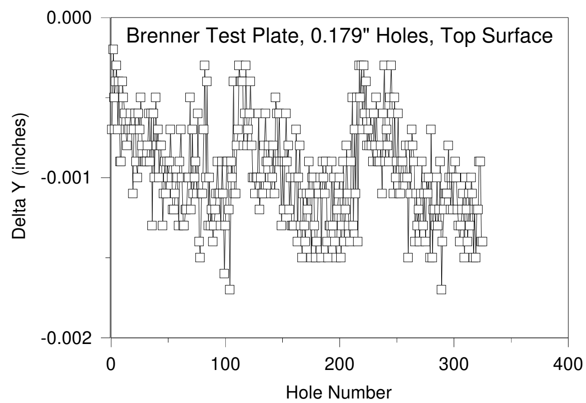


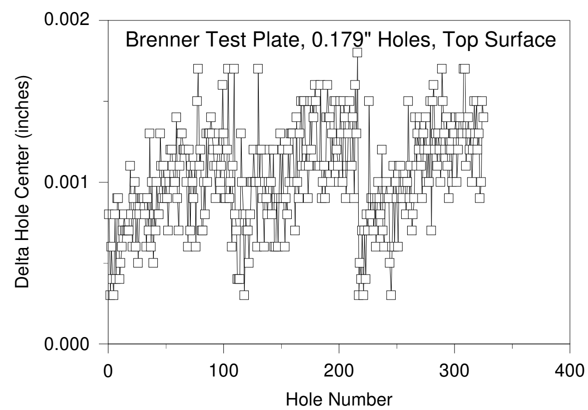


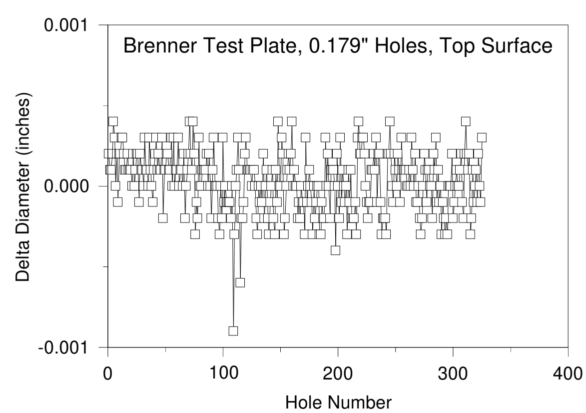
The CMM files are called `top179.mea`, `mid179.mea`, `bot179.mea`, `top099.mea` and `bot099.mea`. `top`, `mid` and `bot` refer to the rows of holes, which were drilled from left to right in a given row, one row at a time. `179` and `099` refer to the hole diameters in inches, 4.5 and 2.5 mm, respectively. The files can be found in the anonymous FTP server `bbr-boyce.slac.stanford.edu` in directory `d:\pub-rfb\sands\brenner`.

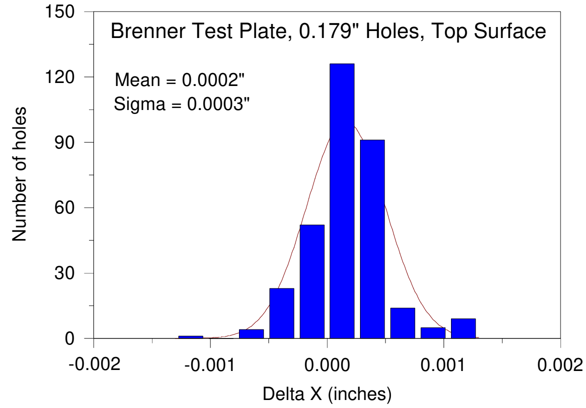
1 Results for 0.179″ Holes

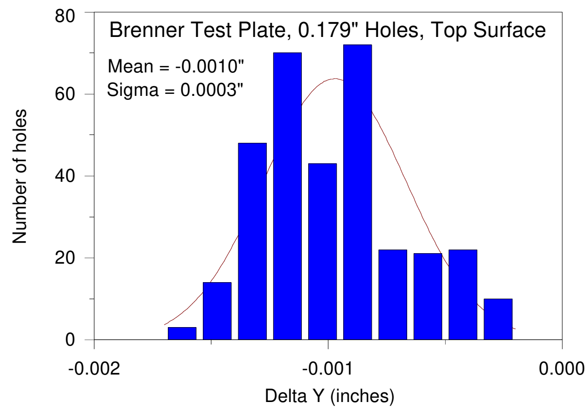


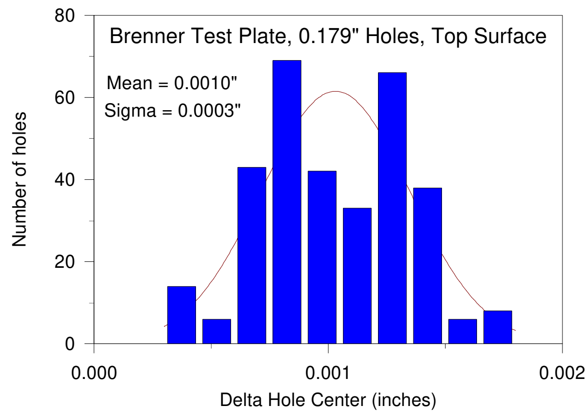


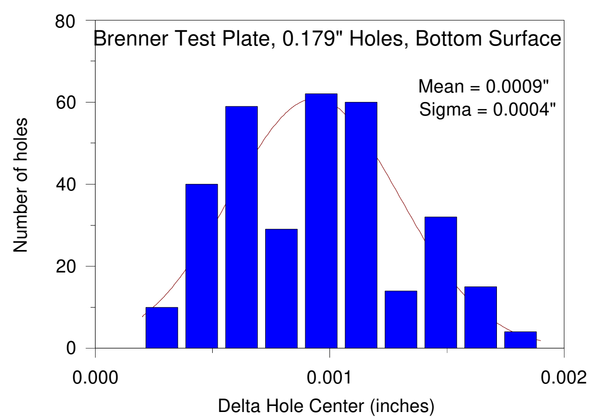


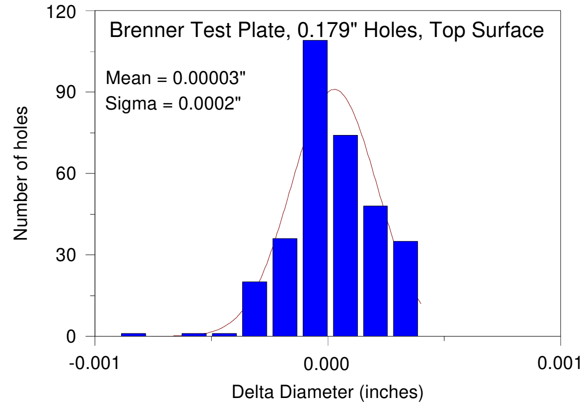


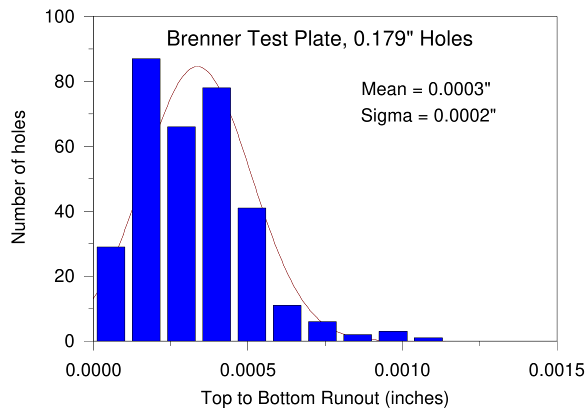

Brenner Test Plate, 0.179" Holes, Top Surface
Mean = 0.0002"
Sigma = 0.0003"
Number of holes
Delta X (inches)

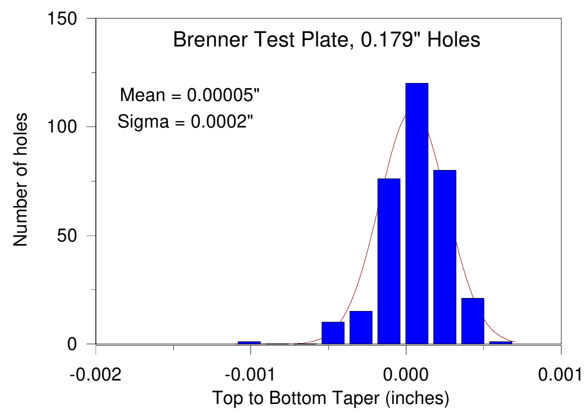

Brenner Test Plate, 0.179" Holes, Top Surface
Mean = -0.0010"
Sigma = 0.0003"
Number of holes
Delta Y (inches)


Brenner Test Plate, 0.179" Holes, Top Surface
Mean = 0.0010"
Sigma = 0.0003"
Number of holes
Delta Hole Center (inches)


Brenner Test Plate, 0.179" Holes, Bottom Surface
Mean = 0.0009"
Sigma = 0.0004"
Number of holes
Delta Hole Center (inches)





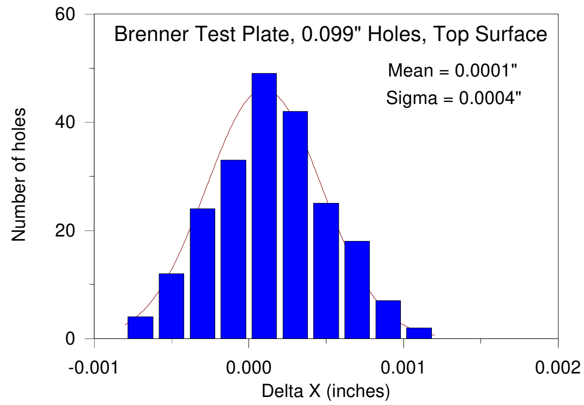


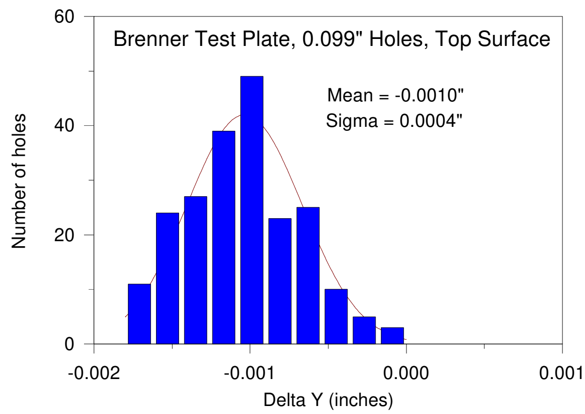
Remarks

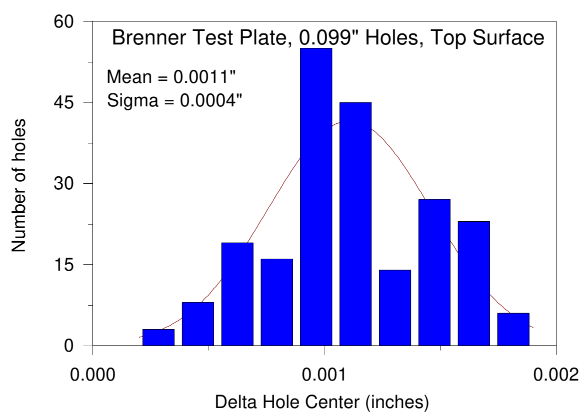
1. The holes diameters are larger than those reported in the above histogram by a small fixed amount related to the geometry of the CMM stylus. We do not have a statement of this offset from Brenner at present. However, they have used go/nogo pins to verify that all holes are actually larger than our mininum specified radius.

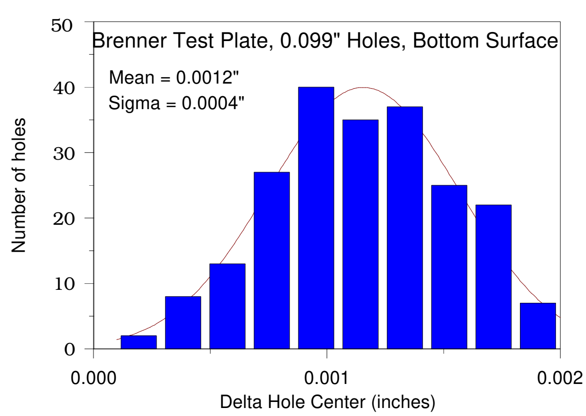
2. In their `.mea` files Brenner reports the offset between measured and ideal hole locations as twice the distance between measured and ideal hole centers, consistent with the machinist's convention for 'true position tolerance'. We report just the distance between measured and ideal hole centers in the above plots.

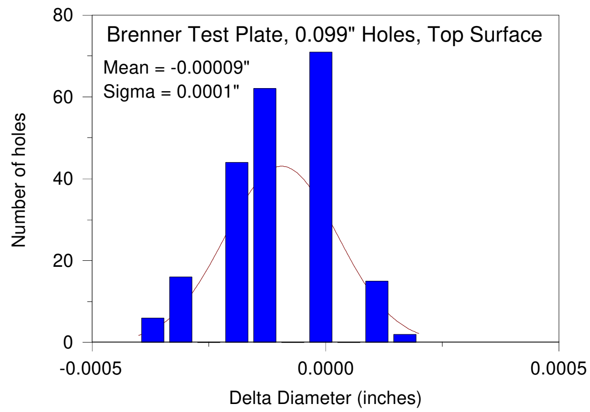
2 Results for 0.099″ Holes

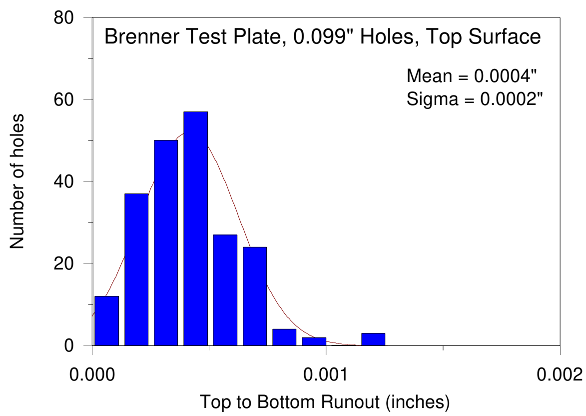


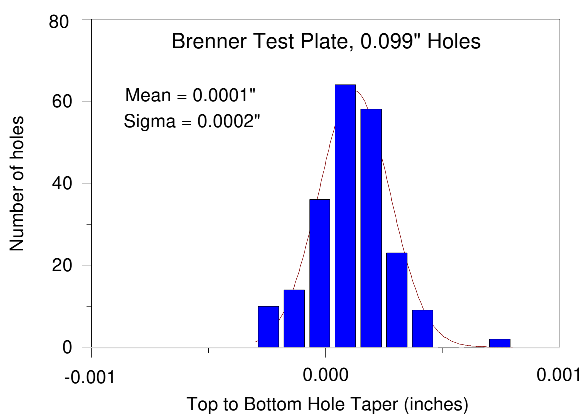







Brenner Test Plate, 0.099" Holes, Top Surface
Mean = -0.00009"
Sigma = 0.0001"
Number of holes
80
60
40
20
0
-0.0005
0.0000
0.0005
Delta Diameter (inches)


Brenner Test Plate, 0.099" Holes, Top Surface
Mean = 0.0004"
Sigma = 0.0002"
Number of holes
80
60
40
20
0
0.000
0.001
0.002
Top to Bottom Runout (inches)


Brenner Test Plate, 0.099" Holes
Mean = 0.0001"
Sigma = 0.0002"
Number of holes
80
60
40
20
0
-0.001
0.000
0.001
Top to Bottom Hole Taper (inches)